



Abbreviated Water and Sewer Needs

CAESARS REPUBLIC SCOTTSDALE

FINAL SEWER BASIS OF DESIGN REPORT

COS CASE NO. 962-PA-2018



FINAL Basis of Design Report

APPROVED

APPROVED AS NOTED

REVISE AND RESUBMIT



Disclaimer: If approved; the approval is granted under the condition that the final construction documents submitted for city review will match the information herein. Any subsequent changes in the water or sewer design that materially impact design criteria or standards will require re-analysis, re-submittal, and approval of a revised basis of design report prior to the plan review submission.; this approval is not a guarantee of construction document acceptance. For questions or clarifications contact the Water Resources Planning and Engineering Department at 480-312-6685.

BY Idillon

DATE 2/20/2020

1) As no documentation could be found by Water Resources the diameter of the 15" existing sewer on Goldwater from connection point of new sewer south was verified and attested to by Olsson as documented in this report. If further as-built documentation is available of this sewer size and alignment please provide that with the plan submittal.

2) Minor discrepancies in hydraulic calculations are noted herein. Olsson's calculations are conservative so Water Resources takes no issue with them,

Prepared For:

HCW

153 S Payne Stewart Drive
Branson, MO 65616

February 2020

Olsson Project No. 018-3159



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EXECUTIVE SUMMARY

This report presents details of future developments that are yet to be master planned with respect to wastewater infrastructure. This information is provided for reference only.

This report is intended to present and analyze the necessary water and sewer infrastructure for the hotel portion only. This revised Basis of Design (BOD) report will be for the Caesar’s Republic Scottsdale, a hotel development on Lot 2 of Scottsdale Fashion Square Amended (BK 1201, PG 8). The report will address the City comments dated July 18, 2019 & January 15, 2020, and will provide a summary of the sanitary sewer analysis for the proposed hotel.

In the future, the ultimate build-out for Lot 2 will consist of the Caesar’s Republic Scottsdale, 2- four story 287,500 square foot office buildings, and 2-one story 10,000 square foot restaurants. At the time of the future build-out, a separate BOD report will be required when an application for a design review on the remaining portion of Lot 2 is presented to the City of Scottsdale.

The City of Scottsdale is currently undergoing increased growth in this area with several development and zoning applications in for City review. During a recent meeting discussing the available sanitary sewer system capacity within Goldwater Boulevard, Scottsdale Road and Camelback Road with the City’s Water Resources Department on October 15, 2019, City staff requested that additional sanitary sewer data be collected on the 10-inch and 15-inch sanitary sewer mains within Scottsdale Road and submitted for review if future phases of construction will be directed to Scottsdale Road. Additional data will include field survey of the existing manholes to determine actual flowline elevations and flow monitoring tests on the 15-inch main just upstream of the canal.

City staff will allow the design review for the westerly portion of Lots 2 consisting of the proposed Caesars Republic Scottsdale, as it is anticipated that this development will discharge sanitary sewer flows to the existing 15-inch main within Goldwater Boulevard along the western boundary of Lot 2.

Although there is capacity for Office Building B, the City has requested that the design review for Office Building B occur when a development review board (DRB) package has been submitted.

The design review for Office A and the two restaurants will occur once the additional data has been collected, as outlined above, and a development review board (DRB) package has been.

TABLE 1: ANTICIPATED SANITARY SEWAGE FLOWS FROM LOT 2

BUILDING	USE	DEMAND (GPD)	DEMAND (GPM)	PEAKING FACTOR, PF	PEAK DEMAND (GPM)
Building C- Caesars Republic Scottsdale	Resort Hotel (w/ Amenities)	101,080	70.19	4.5	315.86
Building C- Caesars Republic Scottsdale	Resort Hotel Pool Backwash	**106,500	**74.0	-	**74.0
Total from Hotel and pool backwash only		207,580	144.19		389.86

** The pool backwash demand for the hotel was provided by the pool supply company, and is not a direct reflection of the City of Scottsdale—2018 Design Standards & Policies Manual, *Figure 7-1.2 Average Day Sewer Demand in Gallons Per Day & Peaking Factors By Land Use. See Section II. General Calculations for further detail and breakdown.*

The flattest section of the 15" line within Goldwater Boulevard between Highland and Camelback is 0.41%. The design criteria for sanitary sewer capacity within the City of Scottsdale is a flow depth to pipe diameter ratio (d/D) of 0.65. To accommodate this design standard, the flow depth within a 15-inch main is 9.75-inches. The allowed maximum capacity of the existing 15-inch main at the slope of 0.41% is 1198 gpm (2.67 cfs). This calculation demonstrates that the 15-inch main within Goldwater Boulevard has sufficient capacity to convey the flow from the proposed Caesar's Republic Scottsdale (1198 GPM > 389.86 GPM).

I. INTRODUCTION

A. Purpose of Report

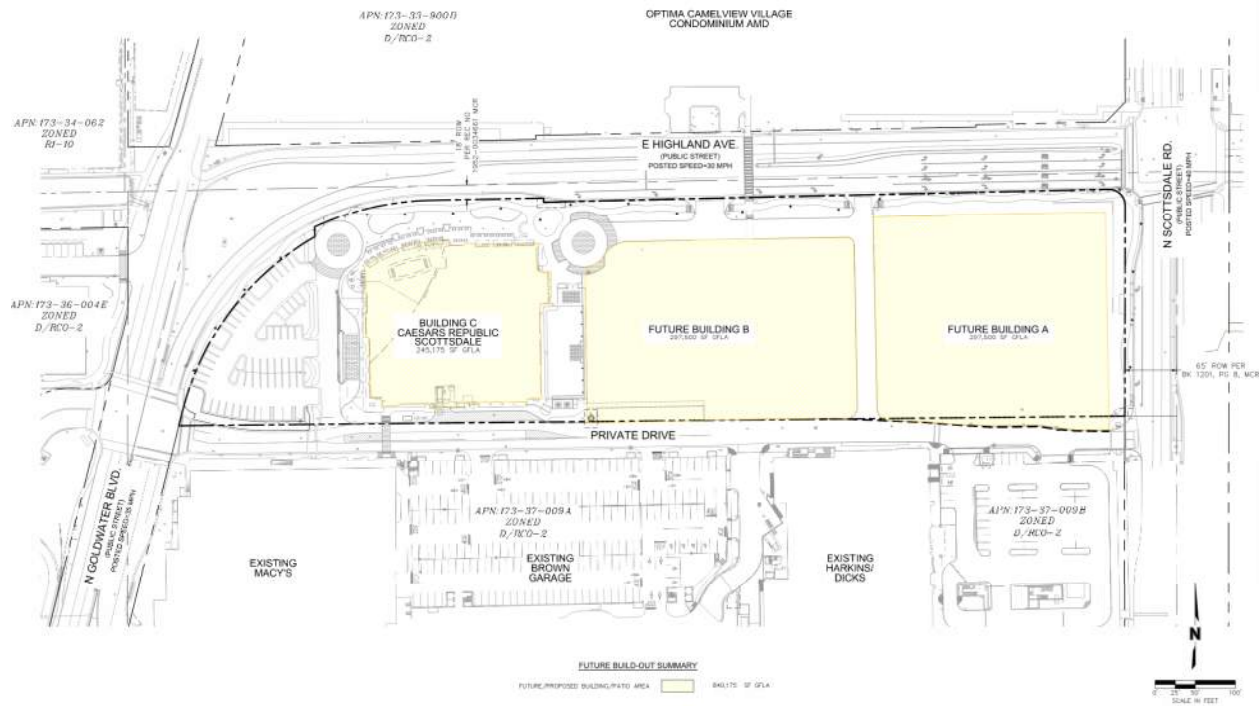
The purpose of this Final Sewer Basis of Design is to support the proposed construction of the Caesars Republic Scottsdale within the Scottsdale Fashion Square- Lot 2 (**Figure 1**). The master planned site will be developed in multiple Phases, with the ultimate buildout of Lot 2 including Caesars Republic Scottsdale, two office buildings (Building A and B), and two restaurants (**Figure 2**). Separate BOD reports will be required as part of the development review board (DRB) package when the two office buildings (Building A and B), and two restaurants are submitted to the City of Scottsdale. As mentioned above, this Final Sewer Basis of Design Report is to support the Caesars Republic Scottsdale only.

Lot-2 encompasses approximately 6.94 acres and is situated within the northeast quarter of Section 22, Township 2 North, Range 4 East of the Gila and Salt River Meridian, Maricopa County, Arizona, is zoned D/DRU-2 PBD DO; 25-ZN2015 & 1-II-2016, and covers approximately 7.04 acres after right-of-way dedications. More specifically The Project site is identified as Maricopa County assessor parcel number 173-37-010, and lies south of Highland Avenue, west Scottsdale Boulevard, north of the Fashion Square Mall, and east of Goldwater Boulevard.



Scottsdale Fashion Square- Lot 2, Per BK 1201, PG 8

Figure 1 – Location/Parcel Map



Building A- Future Office, Retail and Resaurants
Building B- Future Office and Retail
Building C- Caesars Republic Hotel
Figure 2 – Final Buildout Exhibit

B. Contact Information

Owner/Developer

Macerich
 11411 N Tatum Boulevard
 Phoenix, AZ 85028
 Phone: (602) 953-6548
 Contact: Justin Long

Developer

HCW Hotels, LLC
 2398 E Camelback Road, Suite 690
 Phoenix, AZ 85016
 Phone: (602) 469-1226
 Contact: Rick Huffman

Civil Engineer

Olsson
 7250 N. 16th Street, Suite 210
 Phoenix, AZ 85020
 Phone: (602) 748-1000
 Contact: Cardell Andrews

C. Existing Site Conditions

The site has been cleared of buildings and is currently undeveloped. The site previously was developed for several years and included a Days Inn Hotel, Desert Stages Theater, and Coco's Restaurant (see **Figure 3**). By the year 2014, all of the buildings onsite, with the exception of the Desert Stages Theater, were demolished. As of November of 2019, demolition of the Desert Stages Theater began (**Figure 4**). All perimeter public streets are fully improved, and contain both water and sewer utilities. The City of Scottsdale Sewer Quarter Section Map, is located in **Appendix A**.



Figure 3 – Previous Site Land Use (Prior to 2014)



Figure 4 – Existing Site Conditions (Year 2019)

D. Proposed Conditions

Lot 2 will be developed in multiple Phases, including buildings, onsite/offsite site improvements, and when completely built-out will total an additional 840,175 SF Gross Floor Lease Area that will be a part of the greater Scottsdale Fashion Square mall (see **Table 1**). This report addresses the development of the Caesars Republic Scottsdale, located along the western portion of Lot 2 encompassing approximately 1.78 acres. The Caesars Republic Scottsdale will discharge sanitary sewer flows to an existing **15-inch main within Goldwater Boulevard.**

TABLE 2: FINAL BUILDOUT BREAKDOWN

Building	Use	Gross Floor Lease Area (SF)	Rooms
Future Building A1	Office	287,500	N/A
Future Building A2	Restaurant	10,000	N/A
Future Building A3	Restaurant	10,000	N/A
Future Building B	Office	287,500	N/A
Building C- Caesars Republic Scottsdale	Resort Hotel (w/ Amenities)	245,175	266
Total Buildout		840,175	266

The ultimate development will be served by a combination of 6-inch, 8-inch, and 12-inch private gravity flow sanitary sewer lines. Manholes and cleanouts, per City of Scottsdale – 2018 Design Standards & Policies Manual will be placed at each grade and alignment change. Refer to **Appendix B** for the

conceptual Master Sewer Layout, which outlines the proposed connection points, sanitary sewer pipe sizes, flow directions, and sanitary sewer structures proposed for current and future phases.

Since this report addresses the development of the Caesars Republic Scottsdale, **Appendix C** provides construction plans for the Proposed Sewer Layout, associated with the hotel.

II. General Calculations

A. Design Criteria

In accordance with City of Scottsdale—2018 Design Standards & Policies Manual all sanitary sewer lines 12 inches in diameter and less are limited to d/D of 0.65 in the ultimate peak flow condition. The d/D for gravity drains greater than 12 inches diameter shall not exceed 0.70 for the ultimate peak flow condition.

Per City of Scottsdale—2018 Design Standards & Policies Manual, wastewater flows are calculated utilizing *Figure 7-1.2 Average Day Sewer Demand in Gallons Per Day & Peaking Factors By Land Use*. Wastewater flows for uses other than those listed in *Figure 7-1.2 Average Day Sewer Demand in Gallons Per Day & Peaking Factors By Land Use*, shall be based upon known regional or accepted engineering reference sources approved by the Water Resources Department.

City of Scottsdale
Figure 7-1.2 Average Day Sewer Demand in Gallons Per Day & Peaking Factors By Land Use

Land Use	Demand (GPD)	Design Peaking Factor
Office	0.4/SF	3
Restaurant	1.2/SF	6
Resort Hotel (includes site amenities)	380/Room	4.5
**Hotel Pool Backwash	106,500	-

**The pool backwash demand for the hotel was provided by the pool supply company, and is not a direct reflection of the City of Scottsdale—2018 Design Standards & Policies Manual, *Figure 7-1.2 Average Day Sewer Demand in Gallons Per Day & Peaking Factors By Land Use*. The breakdown for the pool backwash demand is outlined below.

Pool Backwash Demand Breakdown

15 FT x 40 FT = 600 SF Pool Area

600 x 4FT = 2,400 CF

2,400 CF * 7.5 GAL/CF = 18,000 GAL

18,000 GAL / 360 MINS (Industry Standard, exceeds MCESD minimum) = 50 GPM

A 50 GPM pool requires a 4.91 SF Sand Filter

50 GPM / 4.91 SF = 10.18 GPM/SF Pool Filtration Rate

4.91 SF x 15 GPM/SF = 73.65 GPM Backwash Rate

The 74 GPM Backwash Rate can be guaranteed with the use for a Variable Speed pump, which recommend for this project.

B. Design Flow

Goldwater Boulevard Sewer Connection

The proposed sewer connection at Goldwater Boulevard will be designed with a minimum slope of 0.56%, and a minimum pipe diameter of 12-inches. Utilizing this design criteria along with the associated use demand, the following flow capacity was calculated as follows:

TABLE 3: PROPOSED WASTEWATER FLOW DEMAND

Building	Land Use	Gross Floor Lease Area (SF) Or Rooms	Demand (GPD)
Future Building B	Office	287,500	287,500 SF x 0.4 GPD/SF= 115,000
Building C- Caesars Republic Scottsdale	Resort Hotel (w/ Amenities)	266 Rooms	266 Rooms x 380 GPD/Room= 101,080
Building C- Caesars Republic Scottsdale	Resort Hotel Pool Backwash	18,000 Gallons	**106,500
Total	-	-	322,580

**See pool backwash demand breakdown in Figure 7-1.2 above.

Total Proposed Flow Demand= 207,580 GPD or 224.01 GPM

TABLE 4: ANTICIPATED SANITARY SEWAGE FLOWS FROM LOT 2 TO GOLDWATER BLVD.

BUILDING	USE	DEMAND (GPD)	DEMAND (GPM)	PEAKING FACTOR, PF	PEAK DEMAND (GPM)
Future Building B	Office	115,000	79.86	3	239.58
Building C- Caesars Republic Scottsdale	Resort Hotel (w/ Amenities)	101,080	70.19	4.5	315.86
Building C- Caesars Republic Scottsdale	Resort Hotel Pool Backwash	**106,500	74.0	-	74.0
Total from Hotel and pool backwash only		207,580	144.19		389.86
Total		322,580	224.0		629.44

**Pool backwash demand shown is for peak demand. See breakdown in Figure 7-1.2 above.

Total Proposed Peak Flow Demand= 906,393.6 GPD or 629.44 GPM

Flow capacity per Manning's formula for uniform pipe flow:

$$Q = \frac{1.49}{n} (A)(R)^{\frac{2}{3}}(S)^{\frac{1}{2}}$$

Where:

- Q = pipe capacity (cfs)
- n = Manning's roughness coefficient
- A = Cross sectional area (ft²)
- R = Hydraulic radius (ft.)
- S = Minimum slope (ft/ft)

Full flow capacity for a 12-inch diameter pipe with a minimum slope of 0.0056 ft/ft:

$$\frac{1.49}{0.013} \left(\frac{\pi}{4} 1^2\right) \left(\frac{1}{4}\right)^{\frac{2}{3}} (0.0056)^{\frac{1}{2}} = 2.67 \text{ cfs} = 1198.38 \text{ gpm}$$

1198.38 gpm capacity > 389.86 gpm peak wastewater flow demand

Flow velocity per Manning's formula for uniform pipe flow:

$$V = \frac{1.49}{n} (R)^{\frac{2}{3}} (S)^{\frac{1}{2}}$$

Where:

V = pipe velocity (ft/s)
 n = Manning's roughness coefficient
 R = Hydraulic radius (ft.)
 S = Minimum slope (ft/ft)

Velocity for a full flowing 12-inch diameter pipe with a minimum slope of 0.0056 ft/ft:

$$\frac{1.49}{0.013} \left(\frac{1}{4}\right)^{\frac{2}{3}} (.0056)^{\frac{1}{2}} = 3.40 \text{ ft/s}$$

3.40 fps >2.5 fps, <10 fps ==> O.K. per City of Scottsdale—2018 Design Standards & Policies Manual

For a 12-inch main, the maximum capacity is $d/D=0.65$. The maximum flow within the sanitary sewer to accommodate a maximum flow depth of 7.8-inches is 1.72 cfs or 771.99 gpm which is greater than the anticipated peak flowrate of 389.86 gpm per City of Scottsdale—2018 Design Standards & Policies Manual Section 7-1.404 and is as follows:

"The depth to diameter ratio (d/D) for gravity SS pipes 12 inches in diameter and less shall not exceed 0.65 in the ultimate peak flow condition. This d/D ratio includes an allowance for system infiltration and inflow. The d/D for gravity drains greater than 12 inches diameter shall not exceed 0.70 for the ultimate peak flow condition. This d/D includes an allowance for system infiltration and inflow."

The total ultimate discharge into Goldwater Boulevard from Lot-2 is proposed to be 629.44 gpm from both the Caesars Republic Scottsdale and the future Office Building B. Therefore, a 12-inch sanitary sewer main will be utilized and connected to the existing **15-inch main within Goldwater Boulevard**.

Full flow capacity for a 12-inch diameter pipe with a minimum slope of 0.0056 ft/ft:

$$\frac{1.49}{0.013} \left(\frac{\pi}{4} 1^2\right) \left(\frac{1}{4}\right)^{\frac{2}{3}} (.0056)^{\frac{1}{2}} = 2.67 \text{ cfs} = 1198.38 \text{ gpm}$$

1198.38 gpm capacity > 389.86 gpm peak wastewater flow demand

Flow velocity per Manning's formula for uniform pipe flow:

$$V = \frac{1.49}{n} (R)^{\frac{2}{3}} (S)^{\frac{1}{2}}$$

Where:

V = pipe velocity (ft/s)
 n = Manning's roughness coefficient
 R = Hydraulic radius (ft.)
 S = Minimum slope (ft/ft)

Velocity for a full flowing 12-inch diameter pipe with a minimum slope of 0.0056 ft/ft:

$$\frac{1.49}{0.013} \left(\frac{1}{4}\right)^{\frac{2}{3}} (.0056)^{\frac{1}{2}} = 3.40 \text{ ft/s}$$

3.40 fps >2.5 fps, <10 fps ==> O.K. per City of Scottsdale—2018 Design Standards & Policies Manual

For a 12-inch main, the maximum capacity is $d/D=0.65$. The maximum flow within the sanitary sewer to accommodate a maximum flow depth of 7.8-inches is 1.72 cfs or 771.99 gpm which is greater than the anticipated peak flowrate of 629.44 gpm. Criteria per City of Scottsdale—2018 Design Standards & Policies Manual Section 7-1.404 as outlined above.

The flattest section of the 15" line within Goldwater Boulevard between Highland and Camelback is 0.41% (see **Appendix B**). To accommodate the d/D ratio of 0.70, the flow depth within a 15-inch main is 10.5 inches. The allowed maximum capacity of the existing 15-inch main at the slope of 0.41% is 1,355.47 gpm (3.02 cfs). This calculation demonstrates that the 15-inch main within Goldwater Boulevard has enough capacity to convey the flow from the proposed Caesars Republic Scottsdale including pool backwash, as well as the future development of Office Building B.

III. Conclusions

A. Summary

This revised Final Sewer Basis of Design Report for the Caesars Republic Scottsdale located on Lot 2 of Scottsdale Fashion Square Amended (BK 1201, PG 8) was prepared in accordance with City of Scottsdale—2018 Design Standards & Policies Manual. The sanitary sewer system described within this report was designed to collect and convey the hotel's wastewater discharge under average day and peak flow conditions. The construction of a 12-inch PVC sanitary sewer main will be required with the construction of the hotel. The 12-inch PVC main will connect to the existing **15-inch sanitary sewer main within Goldwater Boulevard**. A recent survey was conducted to confirm the invert elevations of the existing 15-inch main and design calculations in this report verify that the existing 15-inch main has sufficient capacity to convey the estimated sanitary sewer discharges from the proposed hotel and future Office Building B. In addition, the average required daily flows do not exceed the capacity of the minimum proposed pipe.

B. Effect of Development on Adjacent Properties

Based upon the Flow Data Results, taken over a 9-day period including 2 weekends (**Appendix D**), the additional demand created by the development of the Caesars Republic Scottsdale has no known capacity issues on the existing conditions downstream. It is recommended that the City perform capacity studies on the 15-inch sanitary sewer system south of Camelback Road and the 15-inch sanitary sewer system within Camelback east of the 24-inch canal crossing to ensure adequate capacity for future development and/or needed upgrades to the facility.

APPENDIX “A”

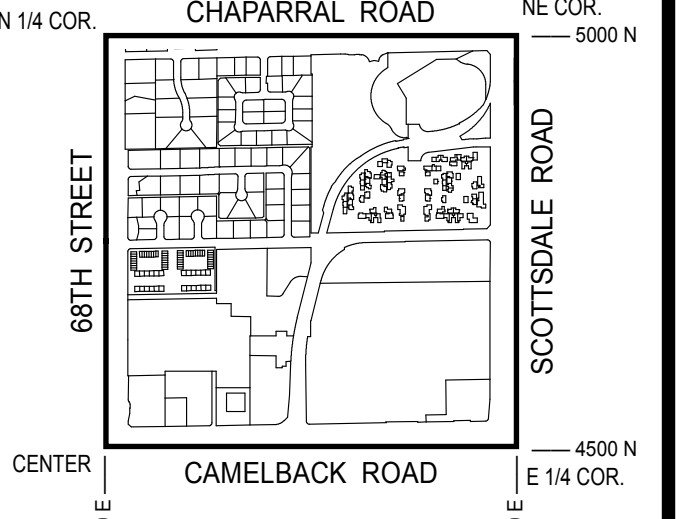
(City of Scottsdale Sewer Quarter Section Map (18-44))

GENERAL NOTES:
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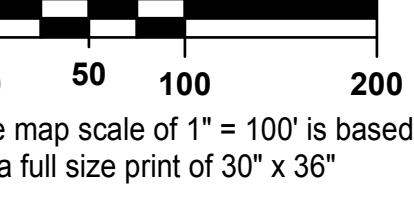
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- Lift Station
- Manhole
- Non-GPS Point
- Plug
- Sewer Service Point
- Sewer Tap Point
- Sewer Valve
- Treatment Plant
- Sewer Main - Gravity
- Sewer Main - Force
- Sewer Main - Private

VICINITY MAP



NORTH

SCALE: 1" = 100'

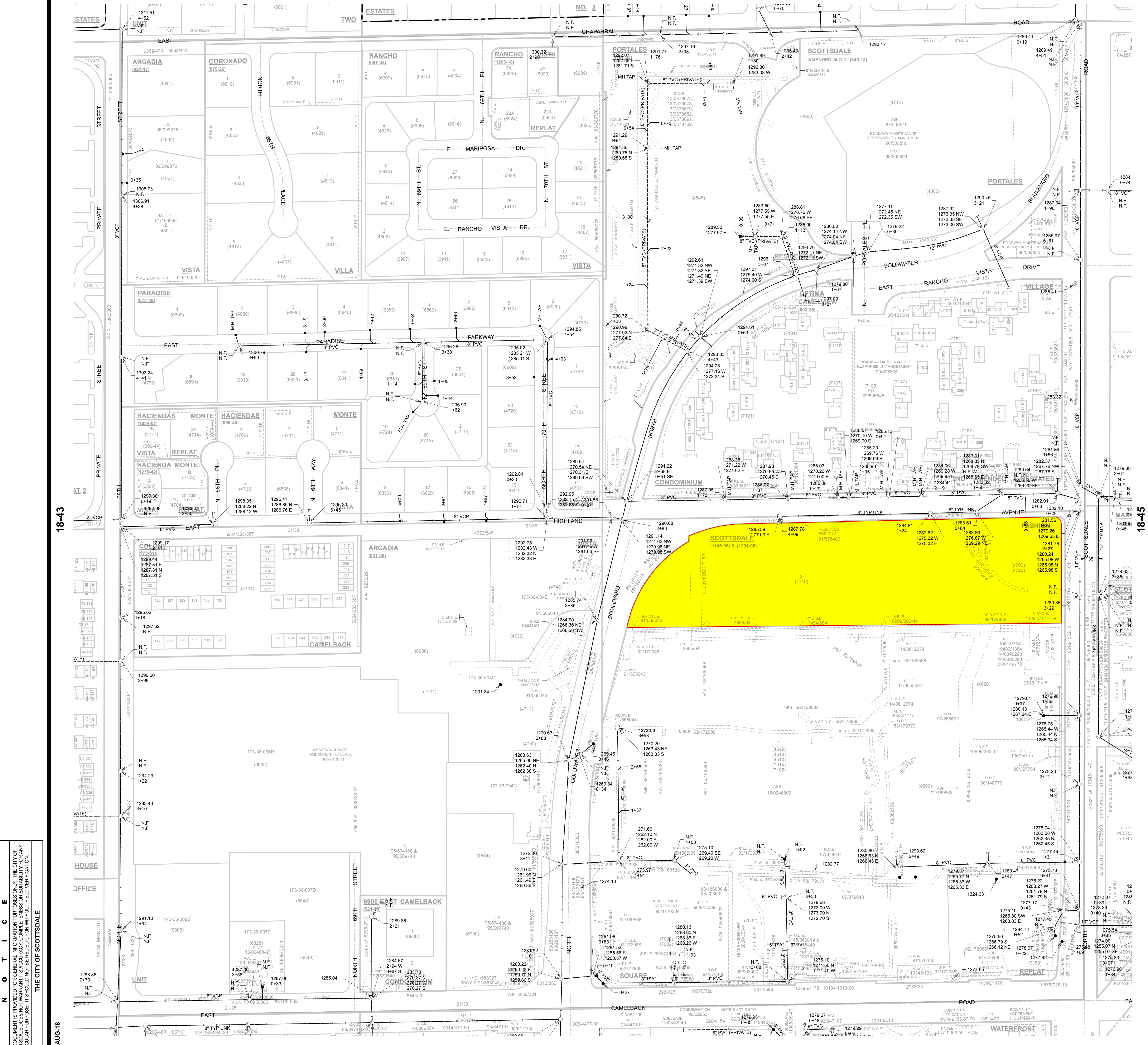


SEWER QUARTER SECTION MAP

18-44

NE 1/4 SEC. 22 T2N R4E

CITY OF SCOTTSDALE
SCOTTSDALE GEOGRAPHIC INFORMATION SYSTEMS
 3623 North Drinkwater Boulevard
 Scottsdale, Arizona 85251















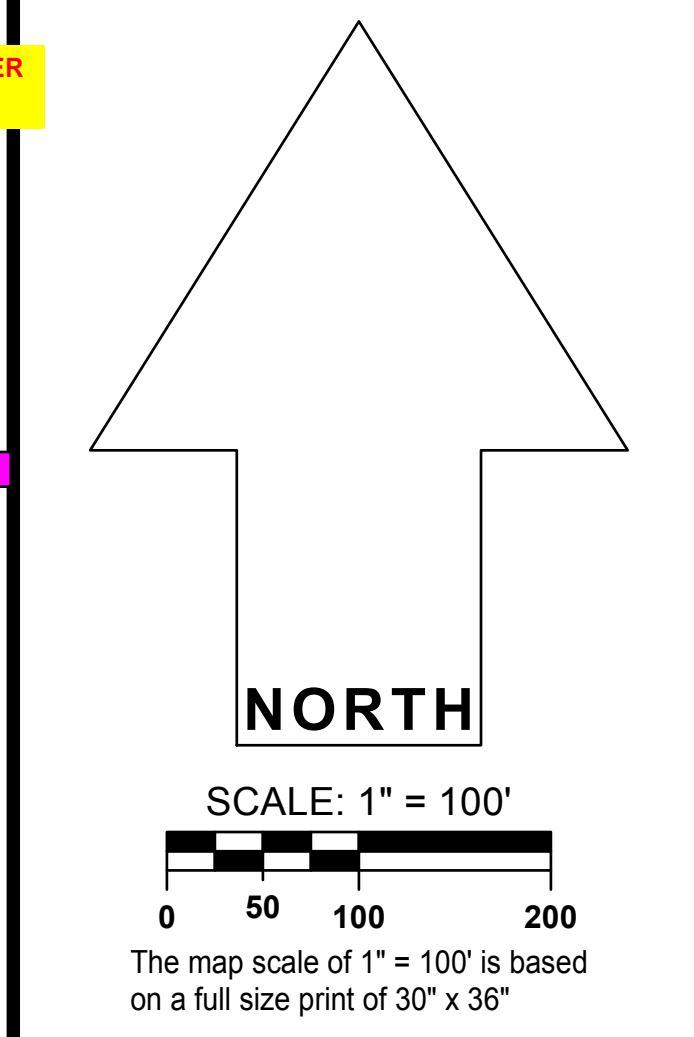
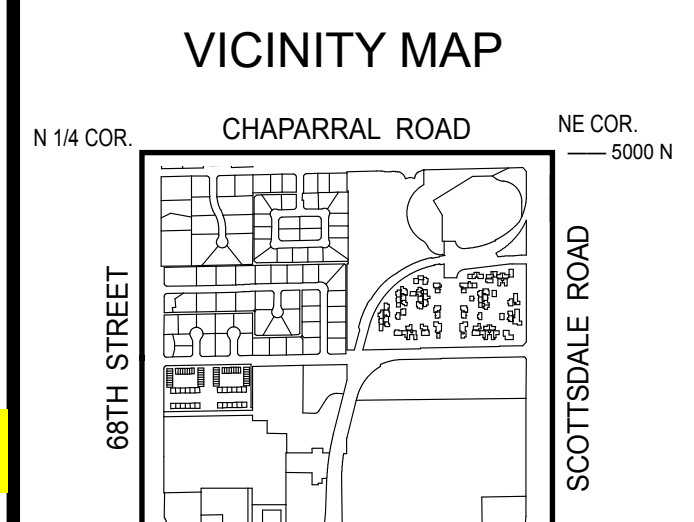
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LEGEND:

- Cleanout 
- Lift Station 
- Manhole 
- Non-GPS Point 
- Plug 
- Sewer Service Point 
- Sewer Tap Point 
- Sewer Valve 
- Treatment Plant 
- Sewer Main - Gravity 
- Sewer Main - Force 
- Sewer Main - Private 



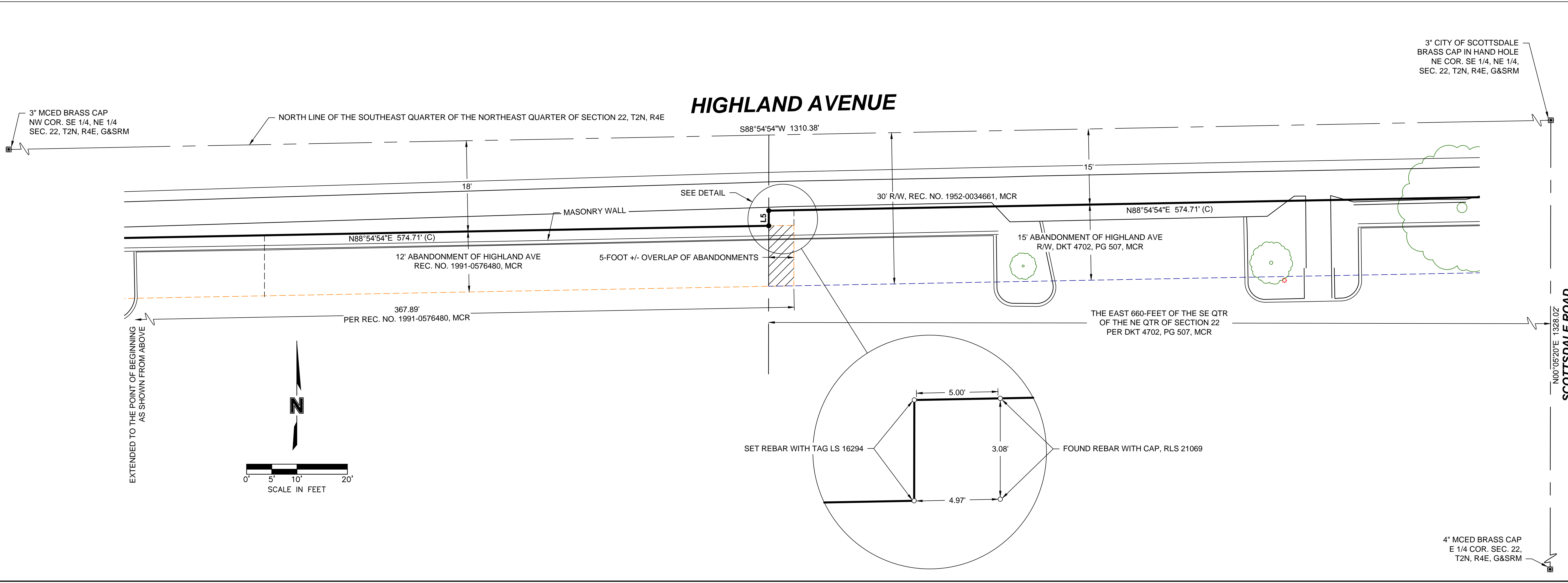
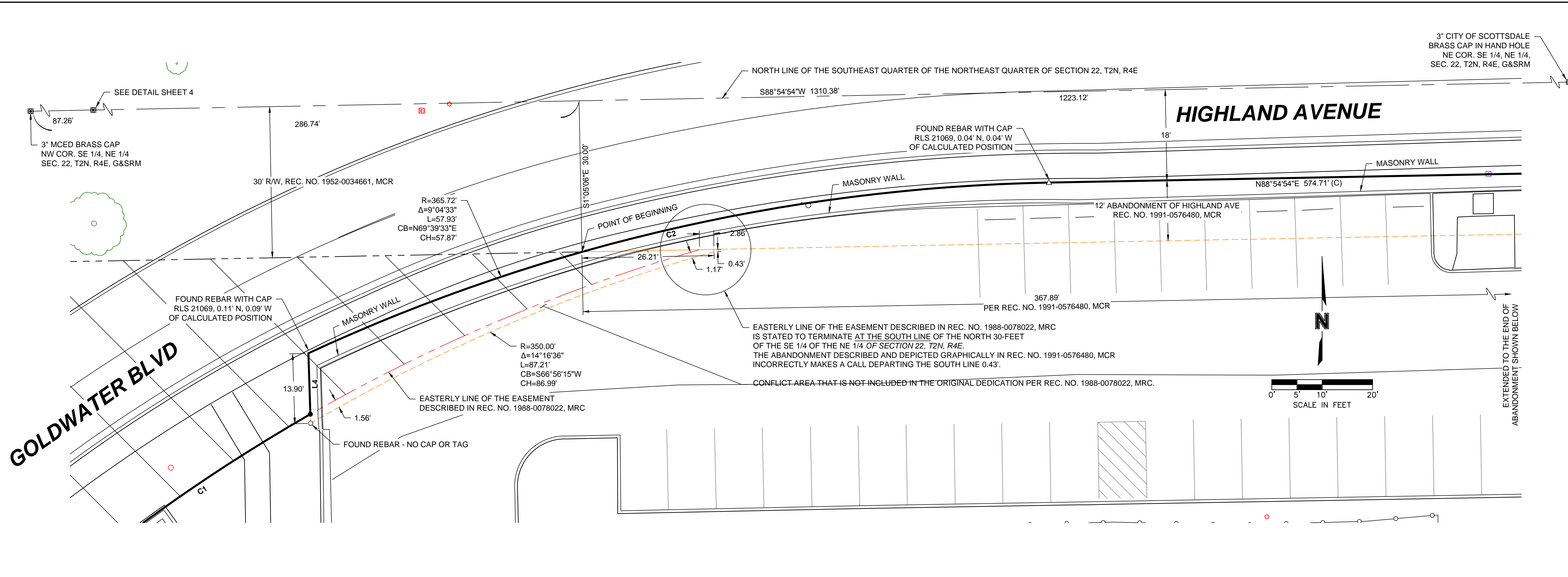
SEWER
QUARTER SECTION MAP
18-44
 NE 1/4 SEC. 22 T2N R4E

CITY OF SCOTTSDALE
SCOTTSDALE GEOGRAPHIC INFORMATION SYSTEMS
 3623 North Drinkwater Boulevard
 Scottsdale, Arizona 85251



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 05-AUG-18

DWG: F:\2018\3001-3500\018-3159\40-Design\Survey\SRVY\ALTA\018-3159 LOT 2 ALTA.dwg
 DATE: Dec 03, 2018 4:41pm XREFS:
 USER: gtorpey



www.olsson.com
 TEL 602.748.1000
 FAX 602.748.1001

olsson

7250 North 16th Street, Suite 210
 Phoenix, AZ 85020-5282

REV. NO.	REVISIONS DESCRIPTION	DATE

ALTA/SPS LAND TITLE SURVEY

LOT 2 - "SCOTTSDALE FASHION SQUARE AMENDED", BOOK 1201, PAGE 8, RECORDS OF MARICOPA COUNTY, ARIZONA, BEING SITUATED WITHIN THE NORTHEAST QUARTER OF SECTION 22, TOWNSHIP 2 NORTH, RANGE 4 EAST OF THE GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, ARIZONA

SCOTTSDALE, ARIZONA

drawn by: GPT
 designed by: MM
 checked by: MM
 project no.: 018-2377
 date: 12/03/2018

SHEET
 5 of 5

017-2266

OA MANHOLE INVERT SHEET

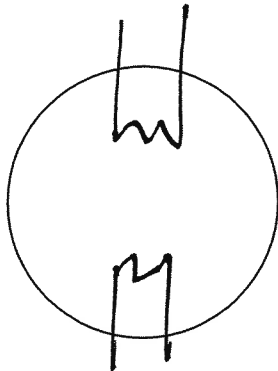


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SDMH

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CBI



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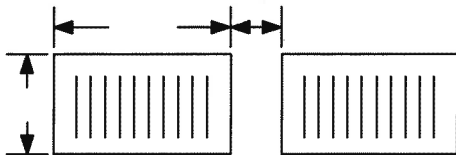
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GRATES



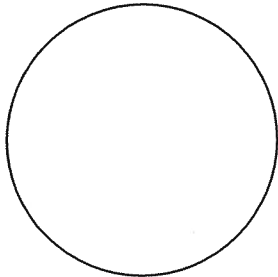
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CBI



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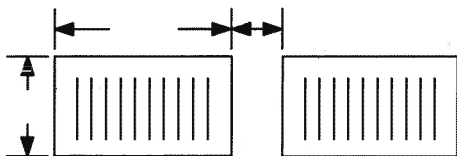
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GRATES



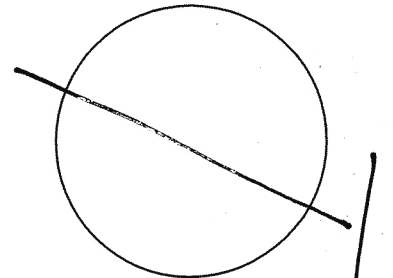
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SSMH

SDMH

GTI

CBI



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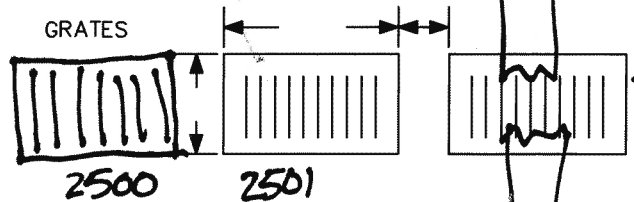
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DIR. S. INV= -10.10' SIZE= 24" ?

DIR. _____ INV= _____ SIZE= _____

DIR. _____ INV= _____ SIZE= _____

GRATES



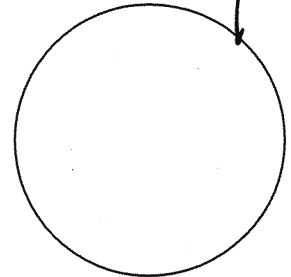
POINT# _____

SSMH

SDMH

GTI

CBI



RIM EL= _____

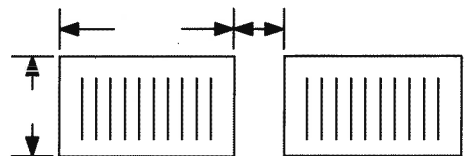
DIR. _____ INV= _____ SIZE= _____

DIR. _____ INV= _____ SIZE= _____

DIR. _____ INV= _____ SIZE= _____

DIR. _____ INV= _____ SIZE= _____

GRATES



07-2260

OA MANHOLE INVERT SHEET

NOT ABLE TO
PULL LEAD
GOT 4 DIP



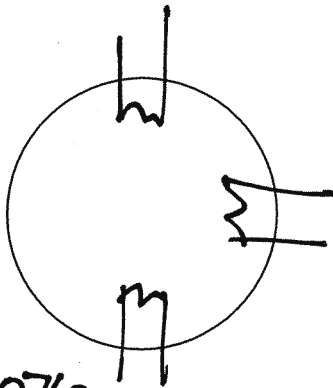
POINT# 10003

SSMH

SDMH

GTI

CBI



RIM EL= 1290.76

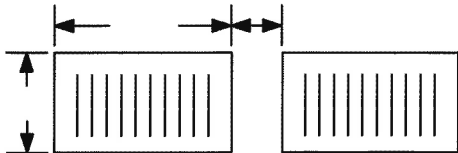
DIR. N INV= -9.30 SIZE= 12"

DIR. S INV= -9.30 SIZE= 12"

DIR. E INV= -9.14 SIZE= 18"

DIR. _____ INV= _____ SIZE= _____

GRATES



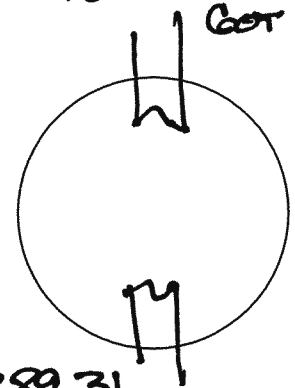
POINT# 10004

SSMH

S

GTI

CBI



RIM EL= 1289.31

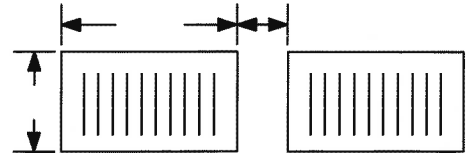
DIR. N INV= -6.89 SIZE= 12"

DIR. S INV= -6.89 SIZE= 12"

DIR. _____ INV= _____ SIZE= _____

DIR. _____ INV= _____ SIZE= _____

GRATES



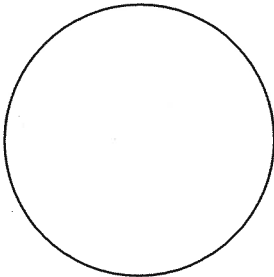
1054
1055
POINT# 1056

SSMH

S

GTI

CBI



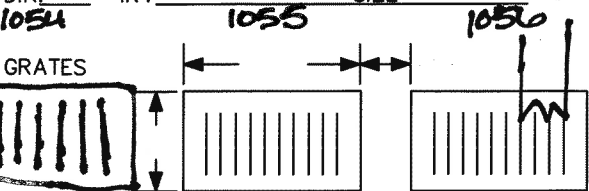
RIM EL= 1290.78

DIR. N INV= -5.80 SIZE= 12" #1056

DIR. _____ INV= _____ SIZE= _____

DIR. _____ INV= _____ SIZE= _____

DIR. _____ INV= _____ SIZE= _____



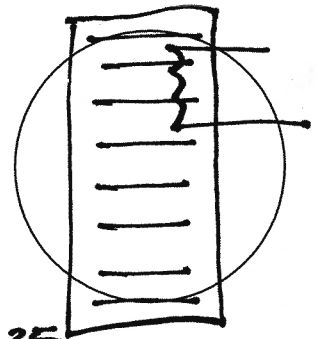
POINT# 5060

SSMH

S

GTI

CBI



RIM EL= 1290.35

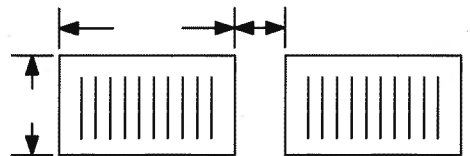
DIR. E INV= -8.05 SIZE= 24"

DIR. _____ INV= _____ SIZE= _____

DIR. _____ INV= _____ SIZE= _____

DIR. _____ INV= _____ SIZE= _____

GRATES



017-2266

OA MANHOLE INVERT SHEET



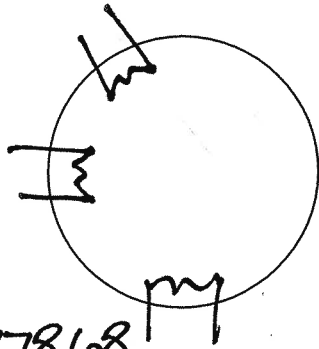
POINT# 1880

SSMH

SDMH

GTI

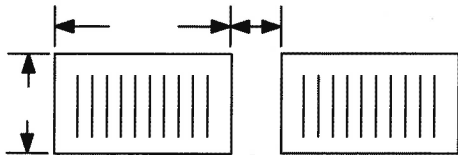
CBI



RIM EL= 1278.68

DIR. NW	INV= -5.66'	SIZE= 18"
DIR. W	INV= -5.66'	SIZE= 18"
DIR. S	INV= -5.66'	SIZE= 18"
DIR. _____	INV= _____	SIZE= _____

GRATES



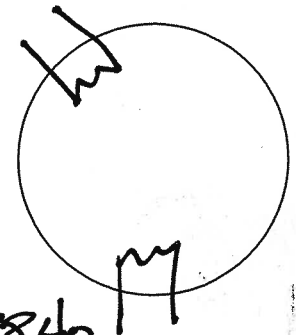
POINT# 30131

SSMH

SDMH

GTI

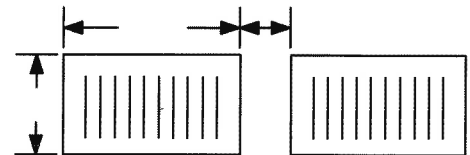
CBI



RIM EL= 1288.40

DIR. NW	INV= -12.80'	SIZE= 18" 24"
DIR. S	INV= -13.06'	SIZE= 18"
DIR. _____	INV= _____	SIZE= _____

GRATES



POINT# 2792

SSMH

SDMH

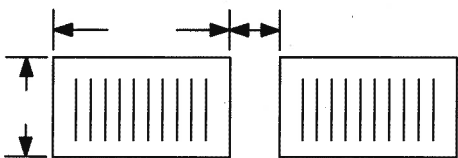
GTI

CBI

INV= 1285.98

DIR. W	INV= 85.98	SIZE= 4"
DIR. _____	INV= _____	SIZE= _____
DIR. _____	INV= _____	SIZE= _____
DIR. _____	INV= _____	SIZE= _____

GRATES



POINT# 10002

SSMH

SDMH

GTI

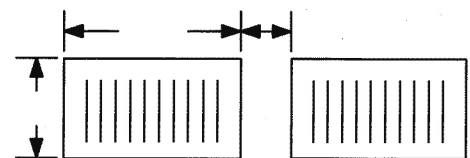
CBI

"CBR"

RIM EL= 1289.53

DIR. N	INV= -5.23	SIZE= 12" ?
DIR. S	INV= -5.23	SIZE= 12" ?
DIR. W	INV= -4.70	SIZE= 8" ?
DIR. _____	INV= _____	SIZE= _____

GRATES



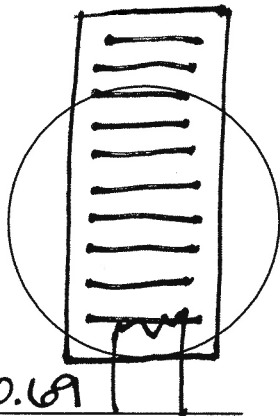
COULD NOT OPEN GRATE
DIPPED THROUGH IT TO
& STRUCTURE

017-22660

OA MANHOLE INVERT SHEET



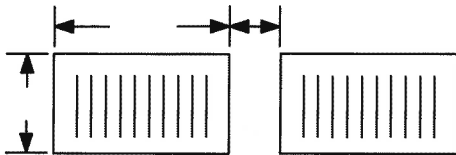
POINT# 319
SSMH
SDMH
GTI CBR
CBI



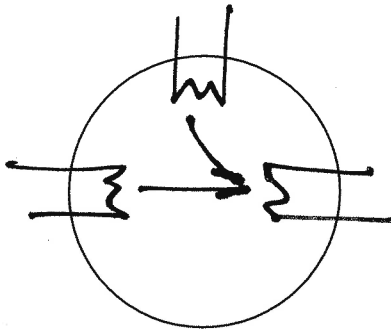
RIM EL= 1290.69

DIR. S. INV= -4.92 SIZE= 12"
DIR. _____ INV= _____ SIZE= _____
DIR. _____ INV= _____ SIZE= _____
DIR. _____ INV= _____ SIZE= _____

GRATES



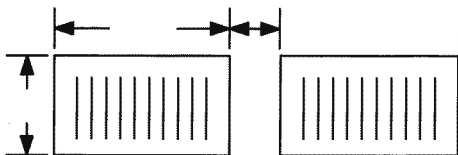
POINT# 160
SSMH
SDMH
GTI
CBI



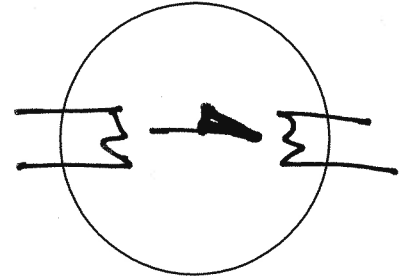
RIM EL= 1292.97

DIR. N. INV= -10.58 SIZE= 8"
DIR. E. INV= -10.58 SIZE= 8"
DIR. W. INV= -10.58 SIZE= 8"
DIR. _____ INV= _____ SIZE= _____

GRATES



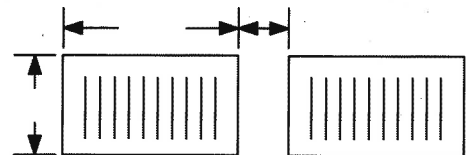
POINT# 290
SSMH
SDMH
GTI
CBI



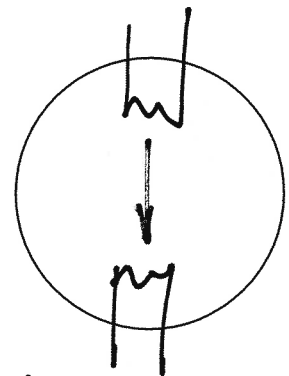
RIM EL= 1291.82

DIR. E. INV= -10.29 SIZE= 8"
DIR. W. INV= -10.29 SIZE= 8"
DIR. _____ INV= _____ SIZE= _____
DIR. _____ INV= _____ SIZE= _____

GRATES



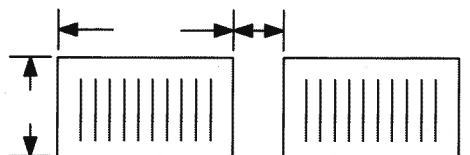
POINT# 1723
SSMH
SDMH
GTI
CBI



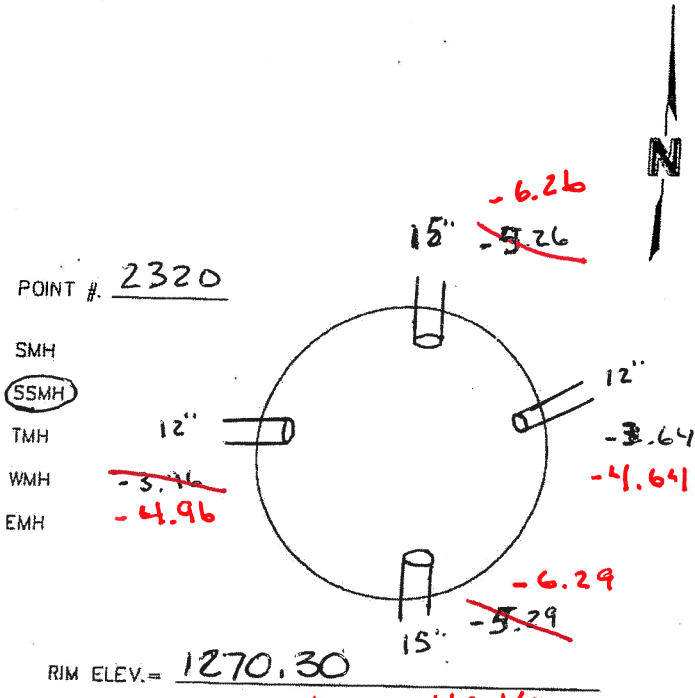
RIM EL=

DIR. N. INV= -17.74 SIZE= 15"
DIR. S. INV= -17.74 SIZE= 15"
DIR. _____ INV= _____ SIZE= _____
DIR. _____ INV= _____ SIZE= _____

GRATES



Red text are survey changes after bench mark adjustments.

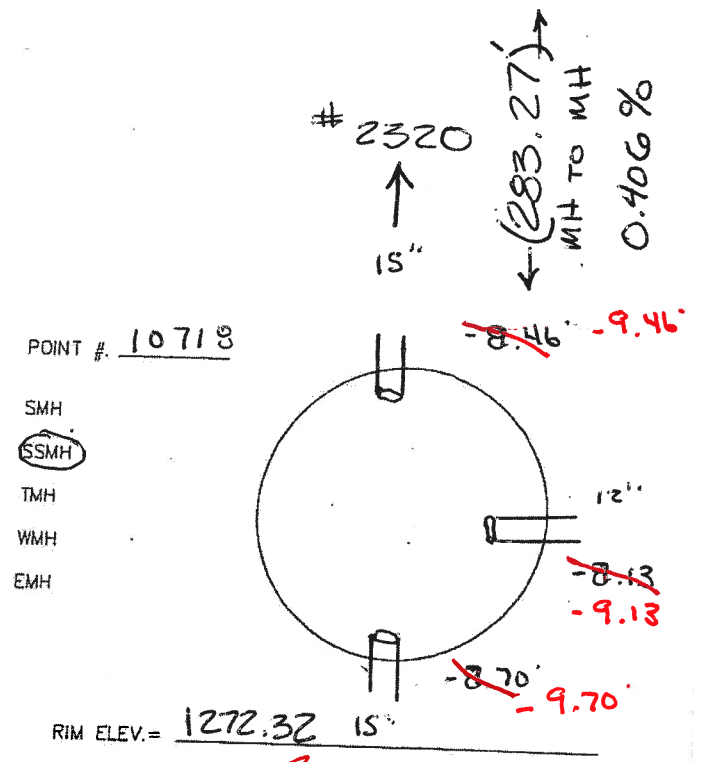


POINT # 2320
SMH
SSMH
TMH
WMH
EMH

RIM ELEV. = 1270.30

INVERT ELEV. = S. 1268.01 SIZE = 15"
N. 1268.04 SIZE = 15"
E. 1266.66 SIZE = 12"
W. 1266.34 12"

DESC. _____

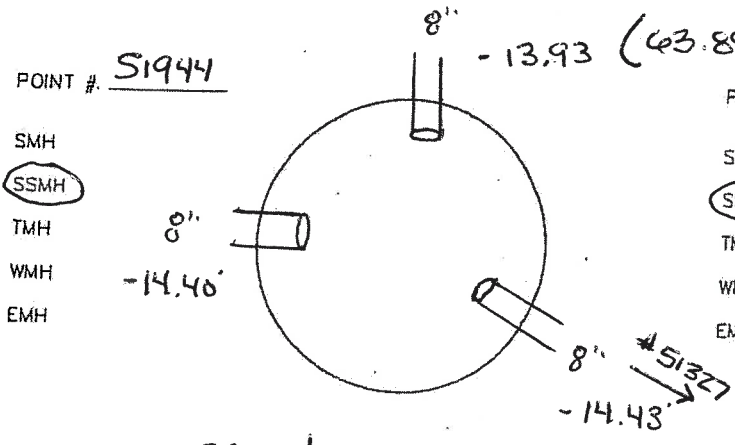


POINT # 10718
SMH
SSMH
TMH
WMH
EMH

RIM ELEV. = 1272.32

INVERT ELEV. = N. 1267.86 SIZE = 15"
S. 1266.62 SIZE = 15"
E. 1264.19 SIZE = 12"

DESC. _____

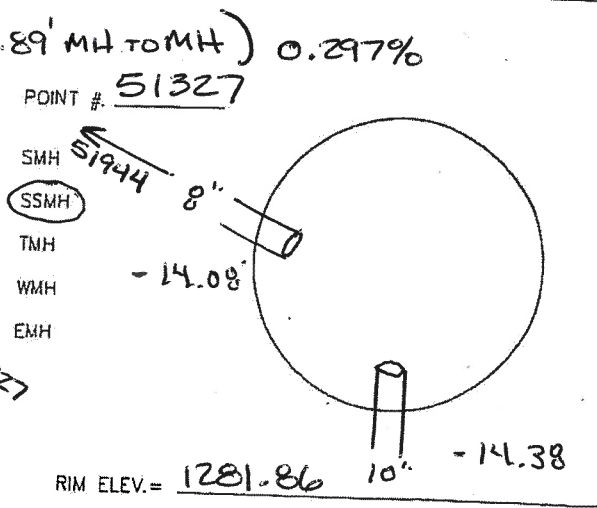


POINT # 51944
SMH
SSMH
TMH
WMH
EMH

RIM ELEV. = 1282.40

INVERT ELEV. = N. SIZE = 8"
W. SIZE = 8"
SE. 1267.97 SIZE = 8"

DESC. _____

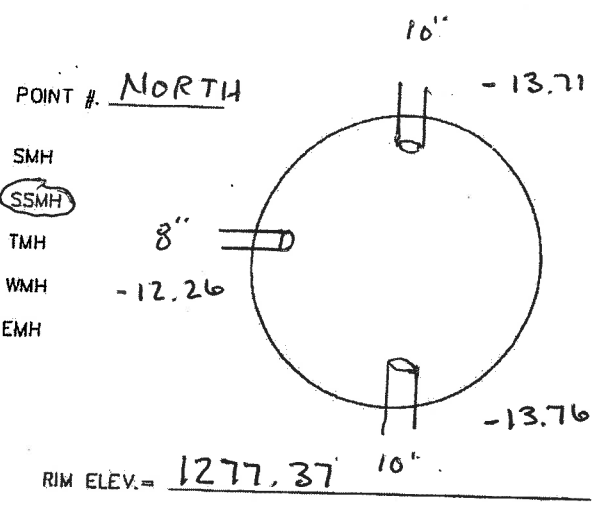


POINT # 51327
SMH
SSMH
TMH
WMH
EMH

RIM ELEV. = 1281.86

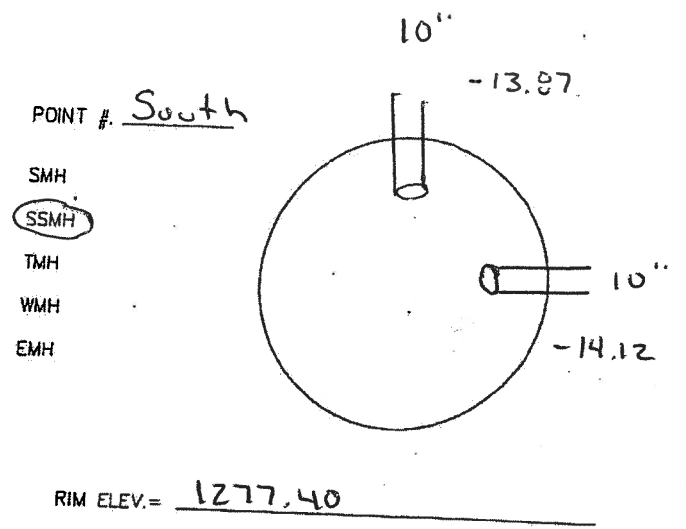
INVERT ELEV. = NW 1267.78 SIZE = 8"
S SIZE = 10"
SIZE =

DESC. _____



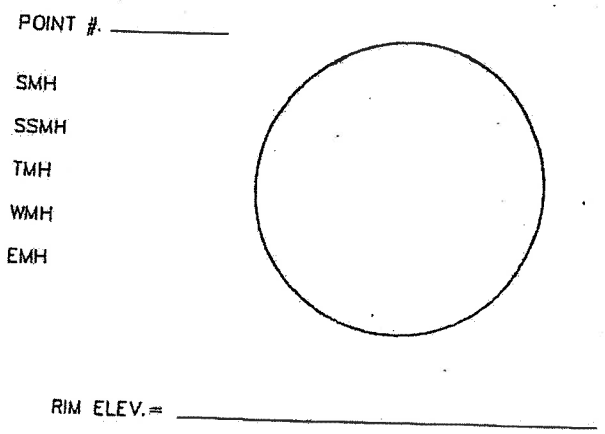
INVERT ELEV. =	<u>1265.11</u>	SIZE =	<u>8" W</u>
	<u>1263.66</u>	SIZE =	<u>10" N</u>
	<u>1263.61</u>	SIZE =	<u>10" S</u>

DESC. _____



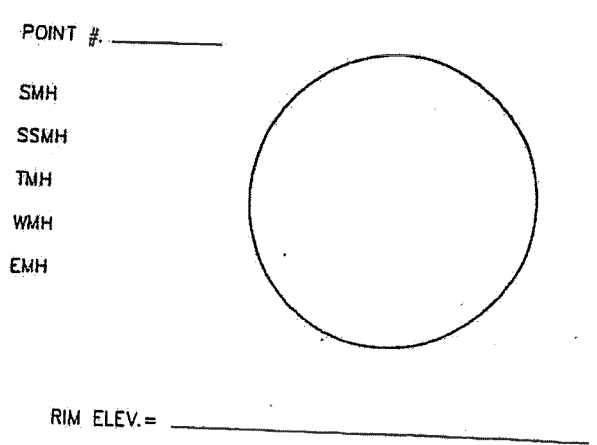
INVERT ELEV. =	<u>1263.53</u>	SIZE =	<u>10" N</u>
	<u>1263.28</u>	SIZE =	<u>10" E</u>
		SIZE =	

DESC. _____



INVERT ELEV. =	_____	SIZE =	_____
	_____	SIZE =	_____
	_____	SIZE =	_____

DESC. _____



INVERT ELEV. =	_____	SIZE =	_____
	_____	SIZE =	_____
	_____	SIZE =	_____

DESC. _____

APPENDIX “B”

(Proposed Master Sewer Layout/Calculations)

Partially Full Pipe Flow Calculations - U.S. Units

Without variable n capacity is 1,559gpm

II. Calculation of Discharge, Q, and average velocity, V for pipes more than half full

controlling segment

Instructions: Enter values in blue boxes. Calculations in yellow

Inputs

Pipe Diameter, D = 15 in
 Depth of flow, y = 10.5 in

(must have $y \geq D/2$)

Full Pipe Manning roughness, n_{full} = 0.013
 Channel bottom slope, S = 0.0041 ft/ft

slight discrepancy

Calculations

n/n_{full} = 1.15
 Partially Full Manning roughness, n = 0.015

Calculations

Pipe Diameter, D = 1.25 ft
 Pipe Radius, r = 0.625 ft

Circ. Segment Height, h = 0.375 ft

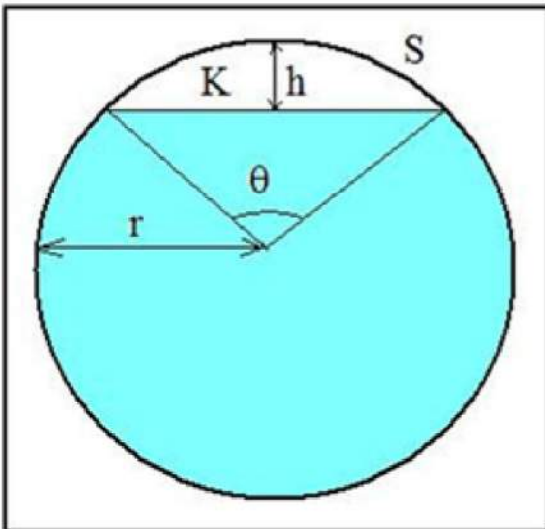
Central Angle, θ = 2.32 radians
 Cross-Sect. Area, A = 0.92 ft²

Wetted Perimeter, P = 2.5 ft
 Hydraulic Radius, R = 0.37 ft

Discharge, Q = 3.02 cfs
 Ave. Velocity, V = 3.29 ft/sec

1355gpm

pipe % full $[(A/A_{full}) * 100\%]$ = 74.8%



Partially Full Pipe Flow Parameters (More Than Half Full)

$$r = D/2$$

$$h = 2r - y$$

(hydraulic radius)

$$R = A/P$$

(Manning Equation)

$$Q = (1.49/n)(A)(R^{2/3})(S^{1/2})$$

$$V = Q/A$$

$$\theta = 2 \arccos \left(\frac{r-h}{r} \right)$$

$$A = \pi r^2 - \frac{r^2(\theta - \sin \theta)}{2}$$

$$P = 2\pi r - r * \theta$$

INPUT	Slope, S	0.0041
	Manning's roughness, n_{full}	0.013
	Manning's roughness is	Variable
	Diameter, D	15 in
	Relative depth, d/D	0.700

Check

Flowrate =	1,321 gpm
Velocity =	3.21 ft/s

n/n_{full}	1.18
Variable 'n'	0.015
Flow, Q	2.9427 cfs
Flow area, A	0.918 sq-ft
Water-surface	3.96 rad
Water-surface	227 deg
Flowrate =	1,321 gpm
Velocity =	3.21 ft/s

Partially Full Pipe Flow Calculations - U.S. Units

II. Calculation of Discharge, Q, and average velocity, V for pipes more than half full

Instructions: Enter values in blue boxes. Calculations in yellow

Inputs

Pipe Diameter, $D =$ in
 Depth of flow, $y =$ in

(must have $y \geq D/2$)

Full Pipe Manning
 roughness, $n_{full} =$
 Channel bottom
 slope, $S =$ ft/ft

Calculations

$n/n_{full} =$
 Partially Full Manning
 roughness, $n =$

Calculations

Pipe Diameter, $D =$ ft
 Pipe Radius, $r =$ ft

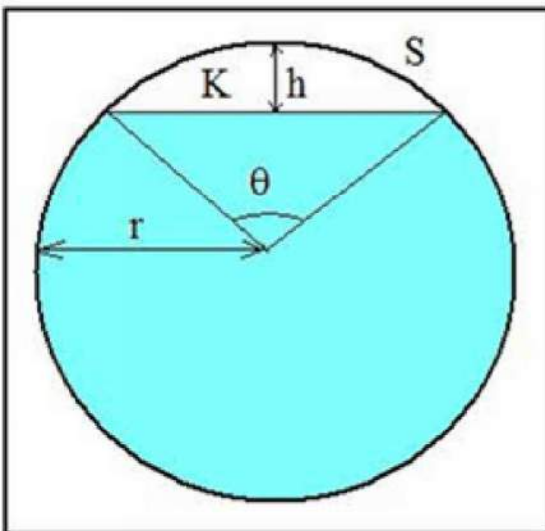
Circ. Segment Height, $h =$ ft

Central Angle, $\theta =$ radians
 Cross-Sect. Area, $A =$ ft²

Wetted Perimeter, $P =$ ft
 Hydraulic Radius, $R =$ ft

Discharge, $Q =$ cfs
 Ave. Velocity, $V =$ ft/sec

pipe % full $[(A/A_{full}) * 100\%] =$



Partially Full Pipe Flow Parameters
(More Than Half Full)

$$r = D/2$$

$$h = 2r - y$$

(hydraulic radius)

$$R = A/P$$

(Manning Equation)

$$Q = (1.49/n)(A)(R^{2/3})(S^{1/2})$$

$$V = Q/A \quad P$$

$$\theta = 2 \arccos \left(\frac{r-h}{r} \right)$$

$$A = \pi r^2 - \frac{r^2(\theta - \sin \theta)}{2}$$

$$P = 2\pi r - r * \theta$$

Partially Full Pipe Flow Calculations - U.S. Units

II. Calculation of Discharge, Q, and average velocity, V for pipes more than half full

Instructions: Enter values in blue boxes. Calculations in yellow

Inputs

Pipe Diameter, $D = 10$ in
Depth of flow, $y = 6.5$ in

(must have $y \geq D/2$)

Full Pipe Manning
roughness, $n_{full} = 0.013$
Channel bottom
slope, $S = 0.011$ ft/ft

Calculations

$n/n_{full} = 1.175$

Partially Full Manning

roughness, $n = 0.015$

Calculations

Pipe Diameter, $D = 0.8333333$ ft
Pipe Radius, $r = 0.4166666$ ft

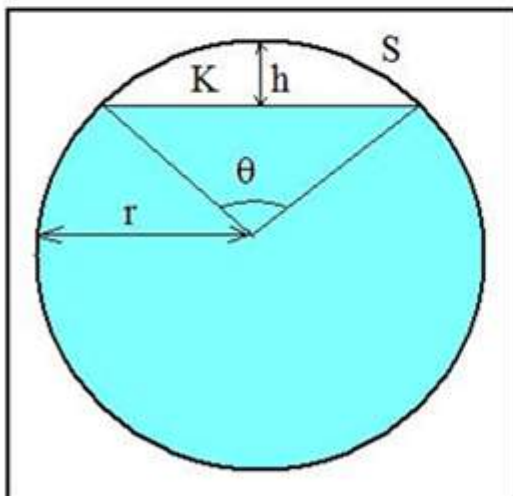
Circ. Segment Height, $h = 0.292$ ft

Central Angle, $\theta = 2.53$ radians
Cross-Sect. Area, $A = 0.38$ ft²

Wetted Perimeter, $P = 1.6$ ft
Hydraulic Radius, $R = 0.24$ ft

Discharge, $Q = 1.48$ cfs
Ave. Velocity, $V = 3.95$ ft/sec

pipe % full $[(A/A_{full}) * 100\%] = 68.8\%$



Partially Full Pipe Flow Parameters
(More Than Half Full)

$$r = D/2$$

$$h = 2r - y$$

(hydraulic radius)

$$R = A/P$$

(Manning Equation)

$$Q = (1.49/n)(A)(R^{2/3})(S^{1/2})$$

$$V = Q/A$$

$$\theta = 2 \arccos \left(\frac{r-h}{r} \right)$$

$$A = \pi r^2 - \frac{r^2(\theta - \sin \theta)}{2}$$

$$P = 2\pi r - r * \theta$$

Partially Full Pipe Flow Calculations - U.S. Units

II. Calculation of Discharge, Q, and average velocity, V
for pipes more than half full

Instructions: Enter values in blue boxes. Calculations in yellow

Inputs

Pipe Diameter, D = in
Depth of flow, y = in

(must have $y \geq D/2$)

Full Pipe Manning
roughness, n_{full} =
Channel bottom
slope, S = ft/ft

Calculations

n/n_{full} =

Partially Full Manning

roughness, n =

Calculations

Pipe Diameter, D = ft
Pipe Radius, r = ft

Circ. Segment Height, h = ft

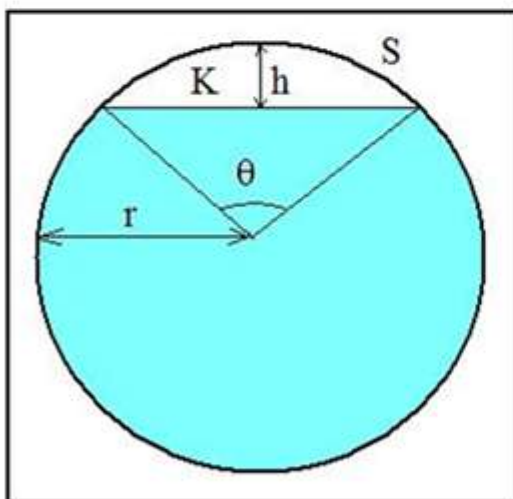
Central Angle, θ = radians
Cross-Sect. Area, A = ft²

Wetted Perimeter, P = ft
Hydraulic Radius, R = ft

Discharge, Q = cfs

Ave. Velocity, V = ft/sec

pipe % full $[(A/A_{full}) * 100\%]$ =



Partially Full Pipe Flow Parameters
(More Than Half Full)

$$r = D/2$$

$$h = 2r - y$$

(hydraulic radius)

$$R = A/P$$

(Manning Equation)

$$Q = (1.49/n)(A)(R^{2/3})(S^{1/2})$$

$$V = Q/A$$

$$\theta = 2 \arccos \left(\frac{r - h}{r} \right)$$

$$A = \pi r^2 - \frac{r^2(\theta - \sin \theta)}{2}$$

$$P = 2\pi r - r * \theta$$

SEWER DEMAND CALCULATIONS -AREA 1

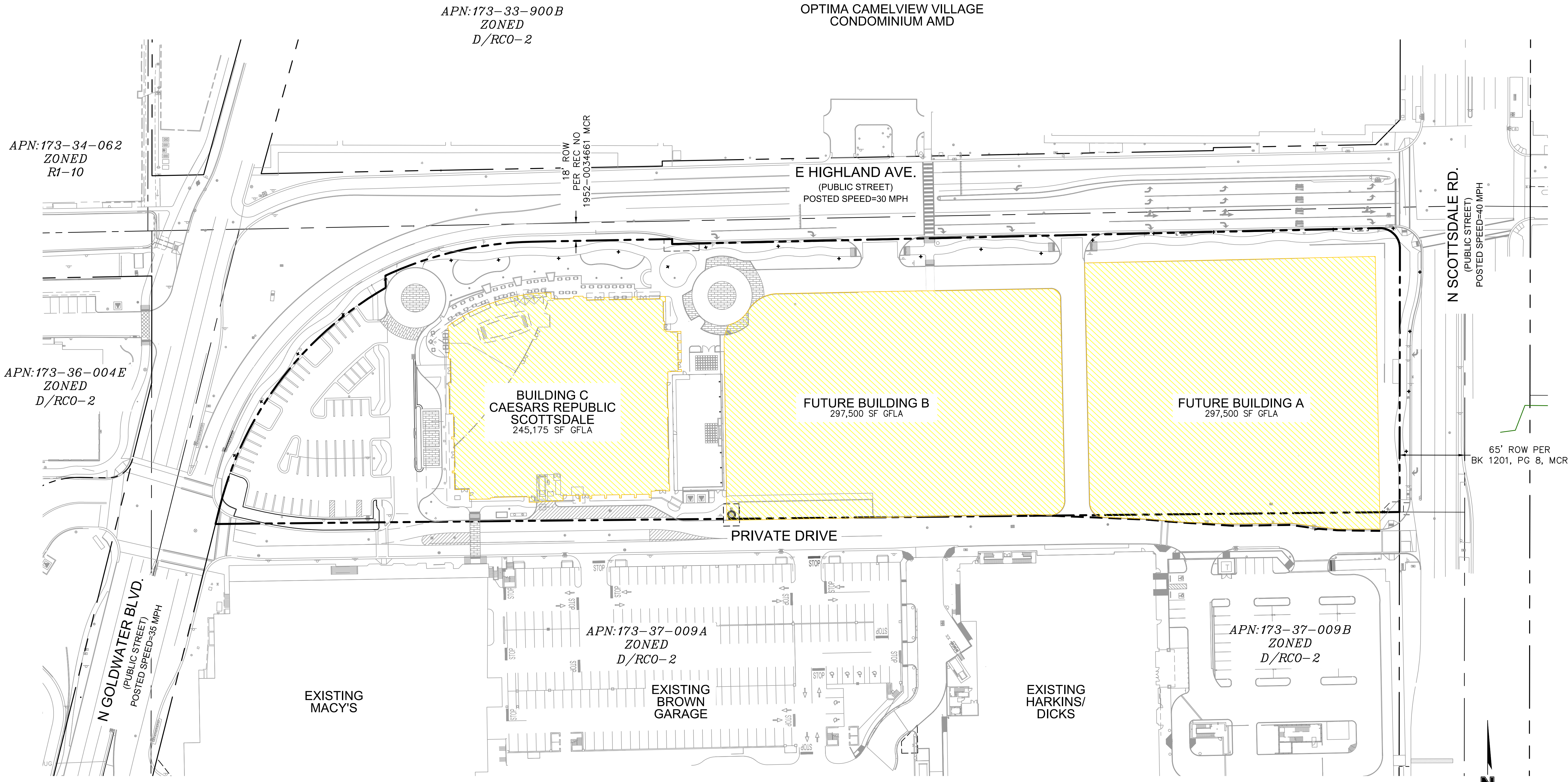
References: Values from City of Scottsdale Design Standards & Policies Manual Fig 7-1.2

Lot ID	Area Description/ Land Use	Area	Rooms	Pools	Avg Daily Flow	Peaking Factor	Avg Daily Demand		Peak Daily Demand	
		(sf)	(RM)	(ea)	(gpsfd or gpud)	(People/Unit)	(gpd)	(gpm)	(gpd)	(gpm)
1	Resort Hotel (W/ Amentities)		266		380	4.5	101,080	70.2	454,860	315.9
2	Resort Hotel Pool Backwash						106,500	74.0	106,500	74.0
3	Office	287,500			0.4	3	115,000	79.9	345,000	239.6
4	Office	287,500			0.4	3	115,000	79.9	345,000	239.6
5	Restaurant	10,000			1.2	6	12,000	8.3	72,000	50.0
6	Restaurant	10,000			1.2	6	12,000	8.3	72,000	50.0
	TOTAL						461,580	320.5	1,395,360	969.0

RM= Rooms
 gpsfd = Gallons per Square Foot per Day
 gpud = Gallons per Unit per Day

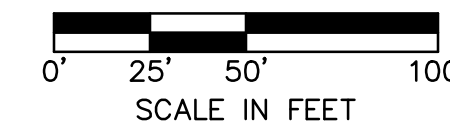
GPD= Gallons per Day
 GPM= Gallons per Minute
 CFS= Cubic feet per Second

DWG: F:\2018\3001-3500\018-3159\40-Design\Exhibits\CROSS FLOOR LEASE AREA.dwg USER: thutchinwss
 DATE: May 29, 2019 5:27pm XREFS: c:\pfe-phase_0183159 c:\arch_0183159 e_pltq_0183159



FUTURE BUILD-OUT SUMMARY

FUTURE/PROPOSED BUILDING/PATIO AREA  840,175 SF GFLA



REV. NO.	DATE	REVISIONS DESCRIPTION

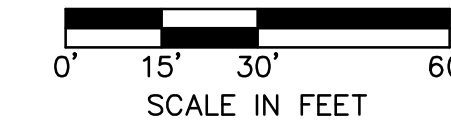
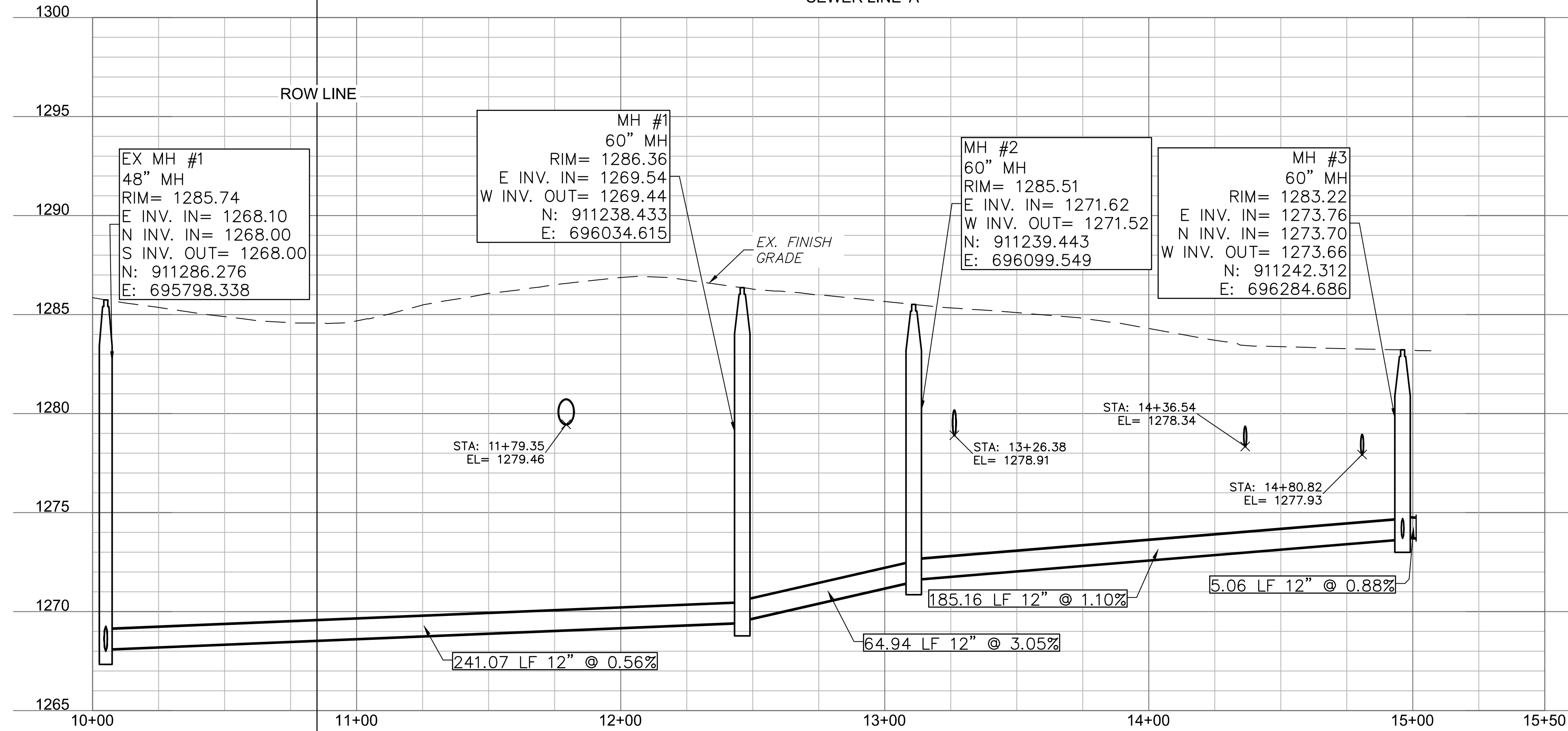
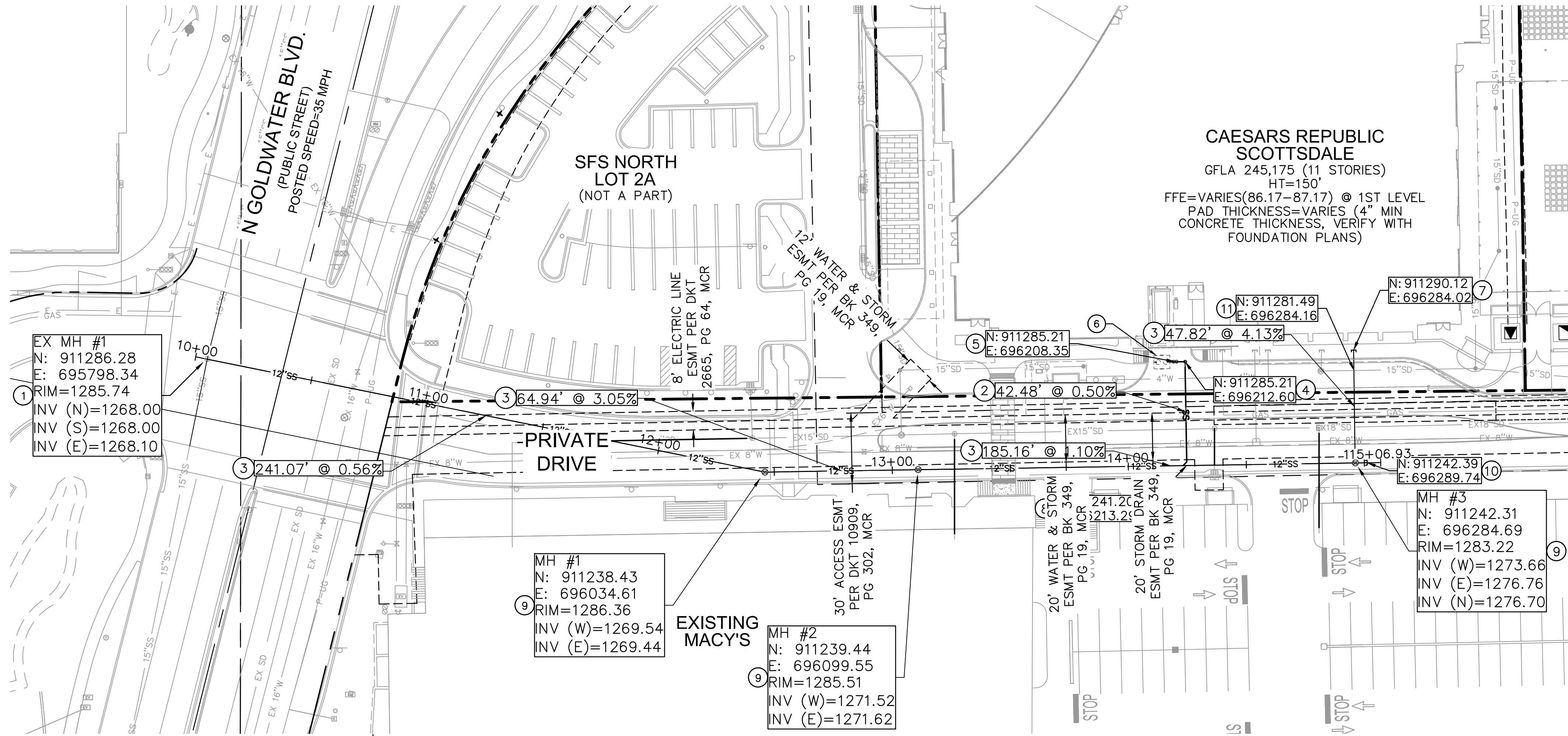
FINAL BUILD-OUT EXHIBIT
 GROSS FLOOR LEASE AREA
 CAESARS REPUBLIC SCOTTSDALE
 2019

drawn by: SS/THW
 designed by: SJV
 checked by: CAI
 project no.: 018-3159
 date: 05.16.2019

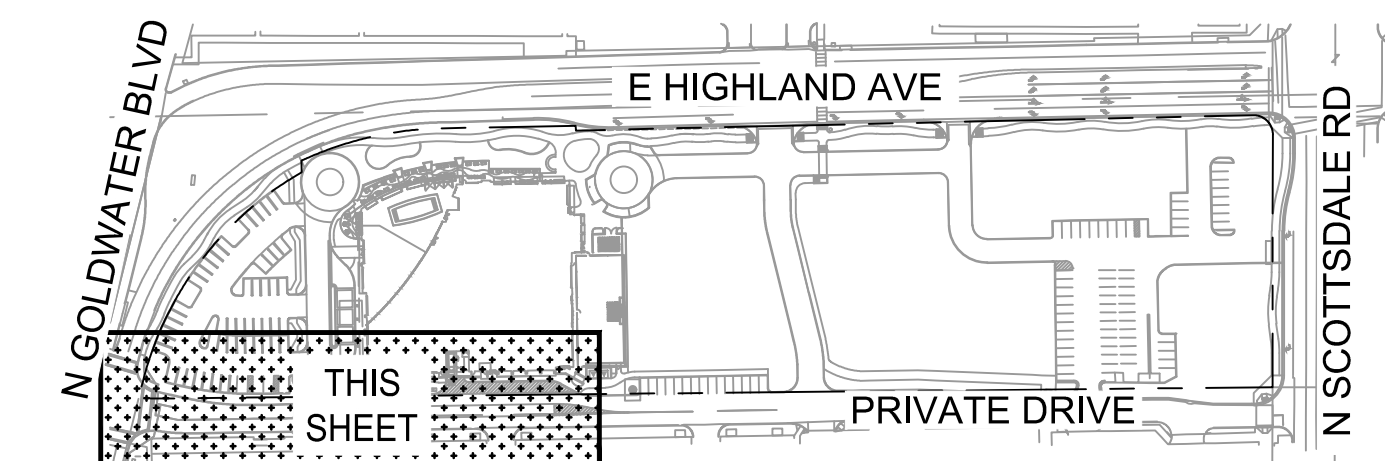


APPENDIX "C"
(Preliminary Utility Plan- Phase I)

DWG: C:\Users\thutchinewss\Desktop\018-3159\018-3159.dwg
 DATE: Dec 19, 2019 10:52pm
 USER: thutchinewss
 PROJECT: C:\BASE_0183159 - CAESARS
 SHEET: C_PUBK_0183159 - CAESARS
 TITLE: C_PBASE_0183159 IMPROVEMENTS
 E_PLT_0183159
 C_PBASE_CAESARS_0183159



- SEWER PLAN KEYNOTES**
- CONTRACTOR TO CORE EXISTING SANITARY SEWER MANHOLE WALL AND INSTALL NEW 12" SERVICE CONNECTION INTO EXISTING STRUCTURE. PAVEMENT REPLACEMENT PER COS DTL 2200 - MATCH EXISTING. TRENCHING AND BACKFILL PER COS DTL 2201. CONTRACTOR TO FIELD VERIFY INVERT INFORMATION PRIOR TO THE START OF CONSTRUCTION AND NOTIFY ENGINEER IF ANY INFORMATION DIFFERS FROM PLAN.
 - 6" PVC SDR35 SEWER SERVICE LINE PER MAG AND C.O.S. SPECIFICATIONS
 - 12" PVC SDR35 SEWER SERVICE LINE PER MAG AND C.O.S. SPECIFICATIONS
 - 6" SEWER CLEAN-OUT. SEE DETAIL G, SHEET C1101
 - 6" TWO WAY SEWER CLEAN-OUT. SEE DETAIL E, SHEET C1101
 - GGI-750 BIGFOOT GRAVITY GREASE INTERCEPTOR. SEE DETAIL H, ON SHEET C1102
 - SEWER SERVICE LINE TERMINATION, SEE MECHANICAL PLANS FOR CONTINUATION INTO BUILDING
 - 6" X 12" WYE CONNECTION
 - 60" MANHOLE PER MAG STD DETAIL 420-1 WITH MANHOLE FRAME AND COVER PER MAG STD DETAIL 423-1 MANHOLE RIM SHALL READ "SANITARY SEWER"
 - 12" PVC SDR35 SEWER SERVICE LINE STUB FOR FUTURE CONNECTION
 - UTILITY CROSSING, MAINTAIN 2' MINIMUM SEPARATION BETWEEN WATER AND STORM PIPES PER MAG STD DTL 404-1. FOR INVERT INFORMATION SEE STORM DRAIN SHEET C302.



olsson
 7878 North 16th Street, Suite 105
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 TEL: 602.748.1000
 FAX: 602.748.1001
 www.olsson.com

Professional Engineer (PE) License
 42633
 ANDREA K. PAGE
 ARIZONA, U.S.A.
 12/19/2019

Call at least two full working days before you begin excavation.
ARIZONA 811
 Arizona Blue Stakes, Inc.
 Dial 8-1-1 or 1-800-STAKE-IT (782-5349)
 Maricopa County (602) 253-1100

REV.	DATE	REVISIONS DESCRIPTION

IMPROVEMENT PLANS
SEWER PLAN & PROFILE

CAESARS REPUBLIC SCOTTSDALE
SE CORNER OF GOLDWATER BLVD AND HIGHLAND AVE
SCOTTSDALE, AZ 85251

2019

2019

drawn by: THW
 designed by: SJV
 checked by: CAI
 project no.: 018-3159
 date: 12.19.2019

C401
 11 of 25

COS P.C. #6952-19-1 CASE #30-DR-2019, 962-PA-2018 25-ZN-2015

APPENDIX “D”

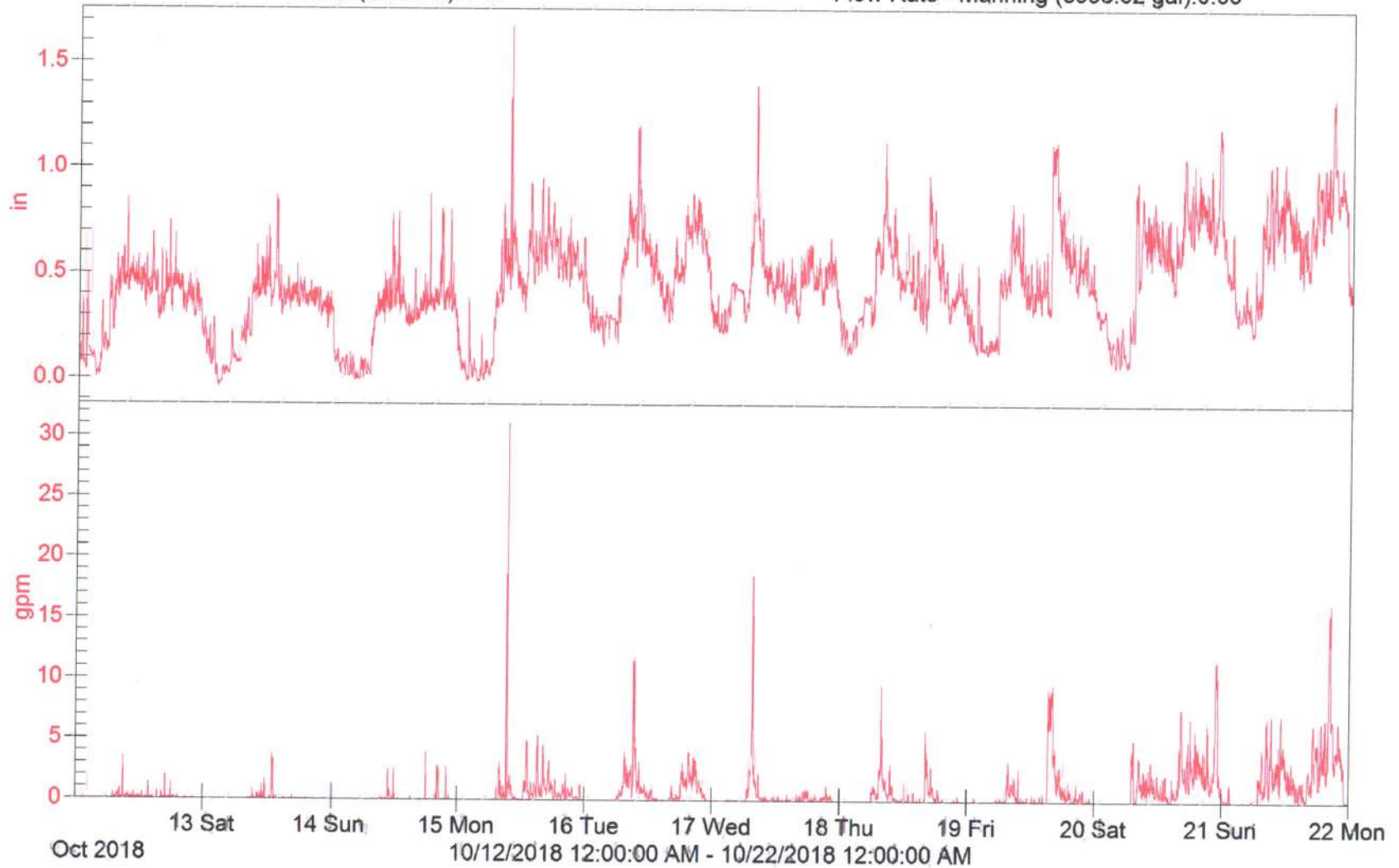
(Flow Data Results, Per Western Environmental Equipment Co.)

Goldwater - Fashion Square 12 inch Line

Flowlink 5

Level (0.447 in):0.09

Flow Rate - Manning (8998.02 gal):0.00



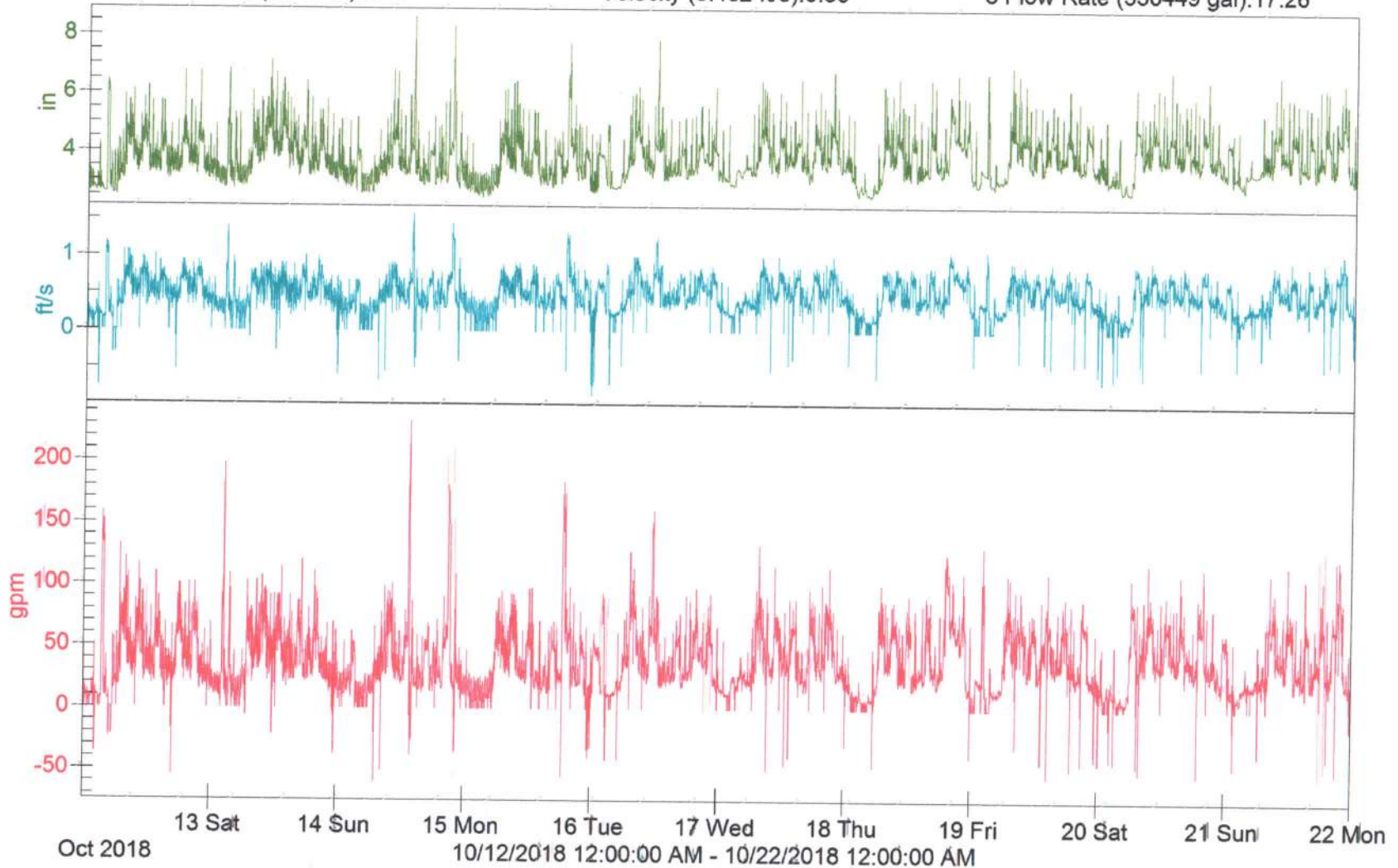
Olsson Highland Ave 8 inch

Flowlink 5

Level (3.787 in):3.19

Velocity (0.482 ft/s):0.30

8 Flow Rate (550449 gal):17.26



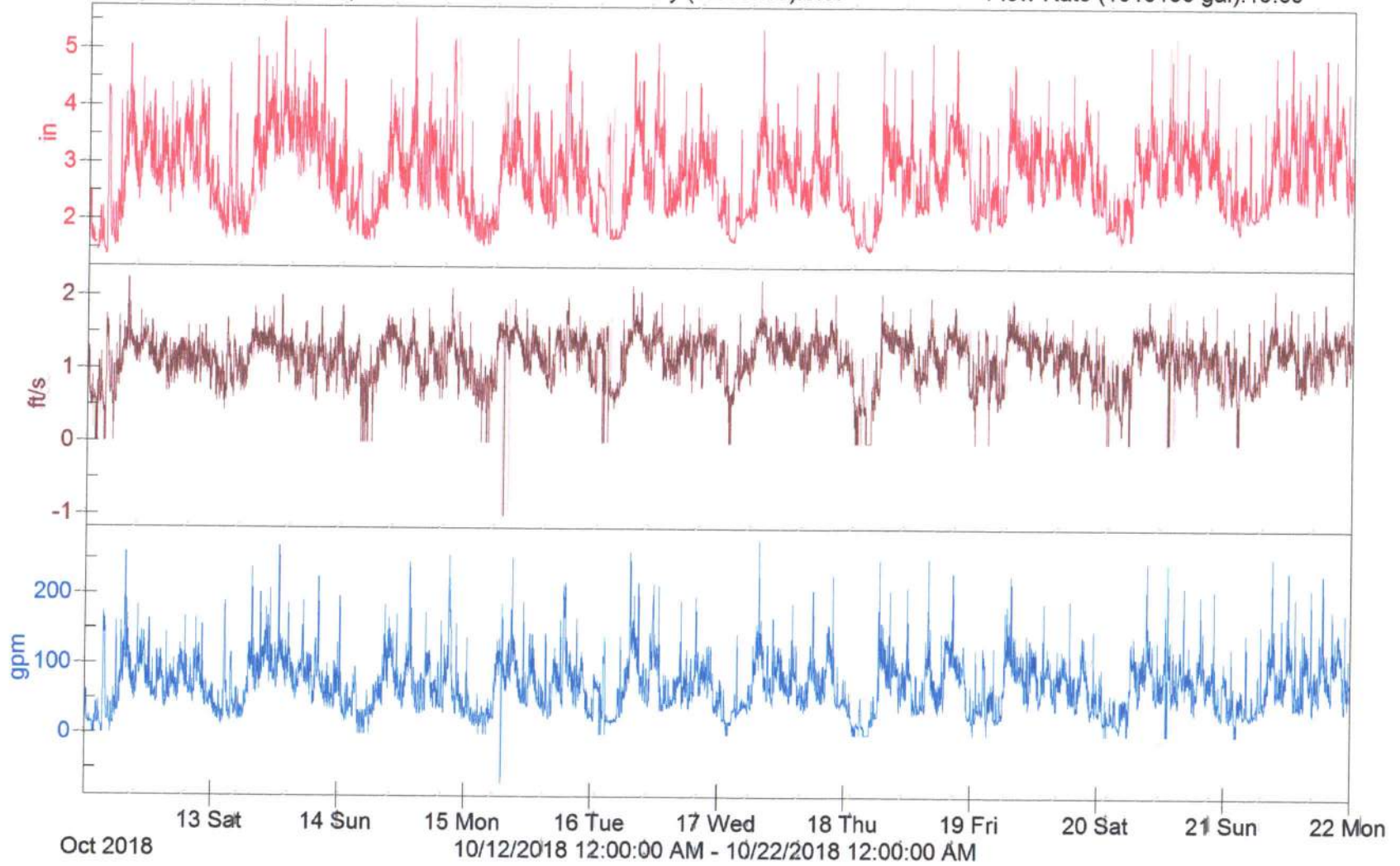
Scottsdale Rd 10 inch Line

Flowlink 5

Level (2.806 in):1.77

Velocity (1.158 ft/s):0.67

Flow Rate (1015130 gal):19.69



**SCOTTSDALE FASHION SQUARE- LOT 2
FINAL SEWER BASIS OF DESIGN REPORT**

Scottsdale, AZ

February 2020

Olsson Project No. 018-3159